



Strategy and Synergy for Security

**Society for Electronic Transactions and Security [SETS]  
MGR Knowledge City, C.I.T. Campus,  
Taramani, Chennai - 600 113.**

**Notice Inviting Tender**

**Tender Notice No.: SETS/Chn/Elec/UPS/2023-24/TR/08**

**Name of Work: Design, Supply, Installation, Testing and commissioning of 30 KVA and 15 KVA UPS machine and it's associated electrical works at SETS, MGR Knowledge City, C.I.T Campus, Taramani, Chennai – 600 113.**

# **Society for Electronic Transactions and Security [SETS]**

**MGR Knowledge City, C.I.T. Campus,**

**Taramani, Chennai - 600 113.**

**Name of the Work : Supply, Installation, Testing and commissioning of 30 KVA and 15 KVA UPS machine and it's associated electrical works at SETS, MGR Knowledge City, C.I.T Campus, Taramani, Chennai.**

**Tender No : SETS/Chn/Elec/UPS/2023-24/TR/08**

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**Society for Electronic Transactions and Security [SETS]  
MGR Knowledge City, C.I.T. Campus, Taramani, Chennai - 600 113.**

**NOTICE INVITING TENDER**

Tenders in TWO parts are invited on behalf of the Executive Director of Institute by the Chief Administrative and Accounts Officer (CAAO, Society for Electronic Transactions and Security [SETS], MGR Knowledge City, C.I.T. Campus, Taramani, Chennai - 600 113, Tamil Nadu from experienced UPS manufacturer / contractors or who are on the approved list of the appropriate class of Central Public Works Department, State Public Works Department, Railways, Military Engineering Services, Public Sector Undertaking of Central / State Governments, Central Autonomous bodies or having similar experience with proven technical and financial capabilities. The tenderer should possess the required UPS system equipments and should have completed similar works (#) Three similar works each costing not less than the amount equal to 40% of the estimated cost put to tender [or] Two similar works each, costing not less than the amount equal to 60% of the estimated cost put to tender [or] One similar work of aggregate cost not less than the amount equal to 80% of the estimated cost during past 3 years ending previous day of last date of submission of tenders.

**Note:** The value of completed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to previous day of last date of submission of tender.

**Tender no : SETS/Chn/Elec/UPS/2023-24/TR/**

Name of work	<b>Design, Supply, Installation, Testing and commissioning of 30 KVA and 15 KVA UPS machine and it's associated electrical works at SETS, MGR Knowledge City, C.I.T Campus, Taramani, Chennai – 600 113</b>
Estimated Cost	<b>Rs. 16,50,000/-</b>
Time of completion	<b>45 Days</b>
Earnest Money Deposit	<b>Rs. 33,000/- (Rupees Thrity Three Thousand only) shall be in the form of Demand Draft from any of the Scheduled Bank drawn in the name of “ Society for Electronic Trasactions and Security (SETS)” payable at Chennai.</b>
Security Deposit	<b>10% of tendered value</b>
Tender processing fee	<b>Nil</b>
<i>Date / Period of availability of tender document for view and download</i>	<b>From 15.03.2024 to 24.03.2024 (15:00 hrs) on website</b>
Last date and time of closing and submission of tenders	<b>24.03.2024 at 15:00 hrs.</b>
Date and Time of on line opening of Technical Bid	<b>25.03.2024 at 10.00 hrs.</b>
Date of opening of Financial Bid of qualified bidders	<b>Date and time will be notified later</b>

1. TENDERS NOT ACCOMPANYING THE FOLLOWING ARE LIABLE TO BE SUMMARILY REJECTED. JOINT VENTURES ARE NOT ACCEPTED.

- a) Proof of registration with Government/Semi Government organizations like CPWD, MES, Railways, State PWD etc./ Reputed Private Organisations in appropriate class OR having experience in execution of similar works. Scanned copy shall be uploaded.
- b) Experiences of having successfully completed works during the last three years ending previous day of last date of submission of tender as follows:

Three similar completed works each costing not less than the amount equal to 40% of the estimated cost put to tender, [or] Two similar completed works each costing not less than the amount equal to 60% of the estimated cost put to tender, [or] One similar completed work of costing not less than the amount equal to 80 % of the Estimated cost under a single contract.

“**Similar works**” shall mean tenderers who have successfully executed “SITC of minimum 15 KVA and 30KVA UPS with its associated works”.

**Note:**

- c) Eligible similar nature of works should have been executed in India only.
- d) In case of the work done under private sector, the completion certificate shall be supported with the copies of TDS certificates.
- e) Should have an average annual financial turnover on works Contract should be at 100% of the estimated cost during the last available three consecutive financial years (FY ending 2023) certified by Chartered Accountant to be enclosed.

Should not have incurred any loss (Profit after tax should be positive) for more than two years during the last available five years (FY ending 31/03/2023). Details shall be furnished duly supported by figures in balance sheet/profit and loss account for the last Three (3) years duly certified by Chartered Accountant as uploaded by the applicant to Income tax department as per Proforma as specified in Form – A.

- f) The bidding capacity of the contractor should be equal to or more than the estimated cost of the work put to tender. The bidding capacity shall be worked out by the following formula:

$$\text{Bidding Capacity} = [A \times N \times 2] - B$$

Where,

**A** = Maximum turnover in electrical works executed in any one year during the last three years taking into account the completed as well as works in progress. The value of completed works shall be brought to current costing level by enhancing at a simple rate of 7% per annum.

**N** = Number of years prescribed for completion of work for which bids has been invited.

**B** = Value of existing commitments and ongoing works to be completed during the period of completion of work for which bids have been invited.

- g) Applicant should enclosed the details of all works of similar class completed in the proforma as specified in Form – C.
  - h) List of projects under execution or awarded shall be submitted as per proforma specified in Form – D.
  - i) Performance report of works referred to in Forms ‘C’ & ‘D’ shall be submitted. as per proforma specified in Form – E.
  - j) Details regarding structure and organization of the firm shall be submitted as per proforma specified in Form – F.
  - k) Details regarding manpower possessed shall be furnished as per proforma specified in Form – G shall be Submitted. The details of trained and certified workmen proposed to be employed at the work site of the project should also be furnished.
  - l) Details of construction plant, machinery, equipment, accessories & infrastructure facilities likely to be used / possessed for carrying out the work shall be furnished as per proforma specified in Form – H.
  - m) PAN and GSTIN Certificate in the latest approved form.
  - n) Certificate (Scanned copy of original certificates to be uploaded)
    - i. Performance Certificates for completed works
    - ii. GST registration certificate
    - iii. PAN (Permanent Account Number) Registration
    - iv. Registration certificate in CPWD / State PWD / MES
    - v. Form A to Form H
    - vi. Relevant work order copies, Schedule of quantities, Work completion and performance certificates etc.
2. UNDERTAKING A to D, Declaration by the contractor to be submitted in their letter head. (Scanned copy to be submitted at the time of submission of Bid and originals shall be submitted during the period of verification of credentials).
  3. Information and instructions for tenderer posted on website shall form part of tender document for tendering mode.
  4. The tender document consisting of Notice Inviting Tender, Scope of Work, General Rules and Directions, Schedule of Quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen and downloaded from website\_\_\_\_\_. free of cost for tendering mode.
  5. The bid can only be submitted along with the mandatory documents of EMD and other documents.
  6. On opening financial bid date, the contractor may depute their representative.

7. SETS reserves the right to accept / reject any prospective application without assigning any reason thereof.
8. Short listing of agencies shall be subject to thorough verification of their credentials and inspection of works carried out by them, through a Technical Screening cum Committee of experts, constituted by SETS.
9. If any information furnished by the applicant is found to be incorrect at a later stage, they shall be liable to be debarred from tendering/ taking up works in SETS. SETS reserves the right to verify the particulars furnished by the applicant independently.
10. Tender will be kept valid for 60 (Sixty) days from the last date of closing of submission of tender.
11. In case of successful tenderer, the tenderer is required to deposit an amount equal to 3% of the tendered value of the contract as irrevocable performance guarantee in the form of Bank Guarantee from *any one of the nationalized Banks or 'Demand draft from any scheduled bank drawn in favour of "Society for Electronic Transactions and Security [SETS]"* within a period of 7 days of issue of letter of intent. The letter of award of work will be issued only after the above said performance guarantee in any one of the prescribed forms is received and accepted failing which the Institute shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the earnest money absolutely. Earnest money deposited along with bid shall be returned after receiving Performance Guarantee. The letter of award of work will be issued only after the above said performance guarantee in any one of the prescribed form is received and accepted failing which the Government shall without prejudice to any other right or remedy available in law, be at liberty to suspended \ debarred for a period of one year.
12. In addition to the above, the successful tenderer is required to remit security deposit amounting to 10% of the tendered and accepted value which shall be deducted the gross amount of the bill.
13. Documentary evidence of adequate financial standing shall be furnished.
14. Bidders shall not be under a declaration of ineligibility for tender quoting and fraudulent practice.
15. Past Performance:-

Even though any bidder may satisfy the above requirements, he would be liable to disqualification if he has,

  - a) Made misleading or false representation or deliberately suppressed the information in the forms, statements and enclosures required in the eligibility criteria document.
  - b) Record of Poor Performance such as abandoning work, not properly completing the contract, or financial failures/weakness etc.
  - c) Any effort on the part of the bidder or his agent to exercise influence or to pressurize the employer would result in rejection of his bid. Canvassing of any kind is prohibited.
16. Information regarding projects in hand, current litigation, orders regarding exclusion, expulsion or block entry if any to be furnished.
17. The capacity of the contractor to take up a new project under consideration in addition to his present commitments must be clearly brought out. He should also furnish the details referring as to have both physically and financially capable of executing this contract in the stipulated time as per milestones projected in addition to executing the other commitments.
18. Copies of original documents detailing the constitution or legal status, place of regulation and principle place of business, written power of attorney of the regulatory of the bond to commit the bidders.

19. Tenderer may please intimate their Bank Account Number, IFSC code, Branch details so as to enable the department for payments through Bank.
20. Qualification and experience of key site management and technical personnel proposed for the contract.
21. Evidence of adequacy of working capital for this contract. Access to lines of credit and availability of other financial resources.
22. Information regarding any litigation, current or during the last seven years, in which the bidder is involved, the parties concerned and disbursed amount.
23. The proposed methodology and program of execution, backed with equipment planning and deployment duly supported with broad calculation and quality control procedures proposed to be adopted, justifying their capability of execution and completion of the work as per technical specifications within the stipulated period of completion as per milestones.
24. Tenderer to note that tenders with any condition including that of conditional rebate shall be rejected forthwith.
25. A certificate to the effect that the firm had not been black listed by any Government Institute, Public sector undertaking or Autonomous Institutions, if so furnish the details.
26. Proposals for sub-contracting components of the works including the qualification and experience of the identified sub-contractor in the relevant field.
27. If the date for submission of tender and opening of tender happens to be a declared holiday at a later date, the same will be postponed to the next working day.
28. PF Clause :All the workers are to be paid applicable minimum wages. Provident Fund (PF) and Insurance schemes (if applicable ) for the workers shall be borne by the contractor. Records with respect to worker wages, PF, insurance, etc. shall be maintained and produced on demand for verification.
29. This Notice Inviting tender shall form a part of the tender document.
30. The contractors shall provide Employees Provident fund, Employees state Insurance or Health Insurance etc. as laid down in the ACT.
31. IT and other applicable shall be deducted from the bills.
32. The rate Quoted by tenderer in the schedule shall be inclusive of Goods and Services Tax (GST) or any other taxes applicable. GST or any other tax applicable in respect of this contract shall be payable by the contractor and SETS will not entertain any claim whatsoever in respect of the same.

For further information please contact Asst. (Admin and Purchase Officer), Phone No : 044-66632505  
Fax no : 044-66632501 on all working days.

The Chief Administrative and Accounts Officer (CAAO) on behalf of the Executive Director, SETS does not bind himself to accept the lowest or any other tender, and reserves to himself the authority to reject any or all of the tenders or to allot parts of the works to different agencies without assigning any reasons therefor. All tenders, in which any of the prescribed conditions is not fulfilled or any condition including that of conditional rebate is put forth by the tenderer, shall be summarily rejected. Please refer our website: [www.setsindia.in](http://www.setsindia.in) / tenders for further details regarding more eligibility criteria if any.

- sd -  
Chief Administrative and Accounts Officer (CAAO)  
For and on behalf of the Executive Director  
SETS

**List of Documents to be submitted within the period of bid submission for tendering:**

**(Copies of certificates to be submitted). The *Original documents for the eligibility criteria as mentioned below should be produced at the Asst. (Admin and Purchase Officer), SETS, Chennai - 113 for verification during the period of verification as indicated in NIT.***

1. EMD Rs. 33,000/- (Rupees Thirty Three Thousand Only) shall be in the form of Demand Draft from any of the Scheduled Bank drawn in the name of "SETS" payable at Chennai and this shall be submitted along with Tender Document.
2. Financial Turn Over certified by CA ending with 2022-23 for last three years.
3. Profit & Loss statement certified by CA ending 2020-23 for last three years.
4. List of SIMILAR WORKS completed in last 3 years indicating:
  - I) Agency for whom executed,
  - II) Value of Work,
  - III) Stipulated and actual time of completion,
  - IV) Completion certificate.
5. List of WORKS in hand indicating:
  - i) Agency
  - ii) Value of Work,
  - iii) Stipulated time of completion / present position.
6. List of tools, equipment and Machinery.
7. List of Technical Staff.
8. Certificates:
  - i) Registration certificates
  - ii) Certificates of Relevant work order copies, Schedule of quantities, Work completion and performance certificates etc.
  - iii) Certificate of Registration for GST and other taxes.
  - iv) PAN (Permanent Account Number) Registration
  - v) Form A to Form H
9. Undertaking A to D as per Annexure-I and Declaration by Contractor as per Annexure - II.
10. Form of Agreement.



**UNDERTAKINGS TO BE FURNISHED BY THE TENDERER**

***UNDERTAKING – A***

“I ..... Son of .....  
Residing at .....  
.....hereby give an undertaking that I have read and I am aware of all the clauses and sub clauses of tender forms including tender technical specifications specified in the tender book and I confirm that I will abide by all the terms and conditions available in this tender document. My Income tax Permanent Account Number (PAN) is .....

*(Seal of the Firm)*

*(Dated Signature of Contractor or his  
authorized Power of Attorney)*

**UNDERTAKING – B**

“I ..... Son of .....

Residing at .....

..... hereby give an undertaking that none of my relative(s) as defined below is / are employed in SETS as per details given in tender document. In case at any stage, it is found that the information given by me is false / incorrect, SETS shall have the absolute right to take any action as deemed fit without any prior intimation to me”

The near relatives for this purpose are defined as;

1. Members of a Hindu undivided family
2. They are husband and wife
3. The one is related to the other in the manner as father, mother, son(s) son’s wife (daughter-in-law), daughter(s) daughter’s husband (son-in-law), brother(s) and brother’s wife, sister(s) and sister’s husband (brother-in-law)

*(Seal of the Firm)*

*(Dated Signature of Contractor or his  
authorized Power of Attorney)*

***UNDERTAKING – C***

I / We have read and examined the Notice Inviting Tender, General Rules & Directions, Form of Tender, Special conditions, Safety code for works contract, General condition of Contract, Schedule F, Specifications, Schedule of Construction, drawings & all other contents in the tender documents for the work AND ACCORDINGLY I / We, hereby tender for execution of the work specified for the Executive Director of SETS within the time specified in Schedule “F”, viz., Schedule of Quantities, List of preferred make and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in Rule 1 of General Rules & Directions and in Clause - 11 of the General Conditions of Contract and with such materials as are provided for, by, and in respects in accordance with, such conditions so far as applicable.

*(Seal of the Firm)*

*(Dated Signature of Contractor or his  
authorized Power of Attorney)*

***UNDERTAKING – D***

I/We undertake and confirm that eligible similar works(s) has / have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for bidding in SETS in future forever. Also, if such a violation comes to the notice of Institute before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit / Performance Guarantee.

*(Seal of the Firm)*

*(Dated Signature of Contractor or his  
authorized Power of Attorney)*

**Annexure - II**

Declaration by Contractor :

This is to certify that;

- 1) I / We have submitted the tenders in the proforma as downloaded directly from the websites which are same as available in the website and there is no change in the format, number of pages, etc.
- 2) I / We have not made any modifications / corrections / additions etc., in the tender documents downloaded from website by me / us.
- 3) I / We have checked that no page is missing and all pages as per the index are available and that all pages of tender document submitted by us are clear and legible.
- 4) In case at later stage, it is noticed that there is any difference in my / our tender documents with the original documents, SETS, shall have the right to cancel the tender / work, forfeit the Earnest Money, Performance Guarantee & Security Deposit, take appropriate action as per the prevailing rules in force and SETS, shall not be bound to pay any damages to me / us on this account.

Dated .....

*(Contractor Signature with seal)*

## FORM 'A' : FINANCIAL INFORMATION

- 1. Financial Analysis** - Details to be furnished duly supported by figures in balance sheet/ profit and loss account for the last five years duly certified by the Chartered Accountant, as submitted by the applicant to the Income Tax Department (copies to be attached).

Particulars	Financial Year		
	2020-21	2021-22	2022-23
i) Gross Annual Turnover ( Rupees in Lakhs).			
ii) Profit ( Rupees in Lakhs)			
iii) Loss ( Rupees in Lakhs)			
iv) Certified By			

***Name and Address of Chartered Accountant***

***with Membership No :***

### **II. Financial arrangements for carrying out the proposed work.**

Line of credit, Working Capital, Liquid Capital, Fixed Deposits etc. - Upload scanned copy of statement.

### **III. The copies of following certificates are to be uploaded.**

- a. Profit & Loss account certified by CA & as submitted to Income Tax Department.
- b. Balance Sheets duly certified by CA for required financial years.
- c. Solvency Certificate from banker's of applicant. Banker's certificates should be on letter head of the Bank. In case of partnership firm, certificate should include names of all partners as recorded with the Bank as said in the Form 'B'.
- d. Form of Agreement of tender document
- e. GST Registration Certificate.
- f. Permanent Account Number (PAN).

### **Name of authorized signatory**

Note: Further details if required may be asked from the contractor after opening of the *bids*. *There is no need to upload the entire voluminous balance sheet.*

shall not be older than one year from the last date of tender submission.



**FORM 'D' : PROJECTS UNDER EXECUTION OR AWARDED**

<b>Sl. No</b>	<b>Name Of The Work/ Project And Location</b>	<b>Owner Or Sponsoring Organization</b>	<b>Cost Of Work (Rupees in Lakhs)</b>	<b>Date Of Commencement as per Contract</b>	<b>Stipulated Date of Completion</b>	<b>Up To Date % Progress of Work</b>	<b>Slow progress if any and reasons thereof</b>	<b>Name And Address/ Telephone Number Of Officer To Whom Reference May Be Made</b>	<b>Remarks</b>

Name of Authorized Signature

**Scanned copy of certificates containing following information from the clients to be submitted**



**FORM-E : PERFORMANCE REPORT OF WORKS REFERRED TO IN FORM "C" & "D"**  
**(Separate certificate for each work/ Project)**

1. Name of work/Project & Location
2. Agreement No.
3. Name of Contractor
4. Estimated Cost
5. Tendered Cost
6. Completed cost
7. Date of start
8. Date of completion
  - (i) Stipulated date of completion
  - (ii) Actual date of completion
  - (iii) Present position of work, if in progress.
9. Amount of compensation levied for delayed completion, if any.
10. Amount of reduced rate items, if any.
11. Performance Report.
  - a) Quality of work : Very Good/Good/Fair/Poor
  - b) Financial soundness : Very Good/Good/Fair/Poor
  - c) Technical Proficiency : Very Good/Good/Fair/Poor
  - d) Resourcefulness : Very Good/Good/Fair/Poor
  - e) General behaviour : Very Good/Good/Fair/Poor
  - f) Time Consciousness : Very Good/Good/Fair/Poor

Dated:

**Executive Engineer or equivalent**  
**Signature with Seal**

## **FORM 'F' : STRUCTURE & ORGANISATION**

1. Name & Postal Address of the applicant:
  
2. Telephone No./Telex No./Fax No.
  
3. Legal status of the applicant (Please tick and attach attested copies of original document defining the legal status)
  - (a) An individual
  - (b) A proprietary firm;
  - (c) A firm in partnership
  - (d) A limited company or Corporation
  
4. Particulars of registration with various Government bodies (attach attested photocopy)  
Dept./Organisation & Place of registration Registration No.
  
5. Names and Titles of Director & Officers with designation proposed to be concerned with this work
  
6. Designation of individuals authorised to act for the organisation
  
7. Was the applicant ever required to suspend construction for a period of more than six months continuously after you commenced the construction? If so, give the name of the project and reasons of suspension of work.

8. Has the applicant or any constituent partner in case of partnership firm, ever abandoned the awarded work before its completion? If so, give name of the project and reasons for abandonment.
  
9. Has the applicant, or any constituent partner in case of partnership firm, ever been debarred / black listed for tendering in any organisation at any time? If so give details.
  
10. Has the applicant, or any constituent partner in case of partnership firm , ever been convicted by a court of law? If so, give details.
  
11. In which fields of Engineering construction the applicant has specialisation and interest?
  
12. Any other information considered necessary but not included above.

**Name and address of the authorized signatory**

**FORM 'G' : DETAILS OF TECHNICAL & ADMINISTRATIVE PERSONNEL TO BE EMPLOYED FOR THIS WORK**

Sl. No	Designation	Total Number	Number available for this work	Name	Qualifications	Professional experience and details of work carried out	How these would be involved in this work	Remarks

**Name and address of authorized signatory**

**FORM 'H' : DETAILS OF TOOLS AND EQUIPMENT LIKELY TO BE USED IN CARRYING OUT THIS WORK**

Sl. No.	Name of Equipment/ Plant	Nos	Capacity or Type & make	Age	Condition	Ownership status				Current Location	Remarks
						Presently owned	Leased	To be purchased	Proposed to be hired		

**Name and address of the authorized signatory**

## **SECTION II - A - INFORMATION & INSTRUCTIONS FOR BIDDERS**

### **1.0 General:**

- 1.1 All information called for in the enclosed forms should be furnished against the relevant columns in the forms. If for any reason, information is furnished on a separate sheet, this fact should be mentioned against the relevant column. Even if no information is to be provided in a column, a "nil" or "no such case" entry should be made in that column. If any particulars/query is not applicable in case of the bidder, it should be stated as "not applicable". The bidders are cautioned that not giving complete information called for in the tender forms or not giving it in clear terms or making any change in the prescribed forms or deliberately suppressing the information may result in the bid being summarily disqualified.
- 1.2 References, information and certificates from the respective clients certifying suitability, technical knowledge or capability of the bidder should be signed by an officer not below the rank of Executive Engineer or equivalent.
- 1.3 The bidder may furnish any additional information which the bidder thinks is necessary to establish their capabilities to successfully complete the envisaged work. The bidder is advised not to furnish superfluous information. No information shall be entertained after submission of eligibility criteria document unless it is called for by the Employer.
- 1.4 Any information furnished by the bidder found to be incorrect either immediately or at a later date, would render him liable to be debarred from tendering/taking up of work in SETS.

### **2.0 Definitions:**

- 2.1 In this document the following words and expressions have the meaning hereby assigned to them.
- 2.2 Employer: Means " The Executive Director, SETS "
- 2.3 Bidder: Means the individual, proprietary firm, firm in partnership, limited company private or public or corporation.
- 2.4 "Year" means "Financial Year" unless stated otherwise.

### **3.0 Method of tender:**

- 3.1 If the bidder is an individual, the tender shall be signed by him/her above his full type written name and current address.
- 3.2 If the bidder is a proprietary firm, the tender shall be signed by the proprietor above his full typewritten name and the full name of his/her firm with its current address.

- 3.3 If the bidder is a firm in partnership, the tender shall be signed by all the partners of the firm above their full type written names and current addresses, or, alternatively, by a partner holding power of attorney for the firm. In the later case a certified copy of the power of attorney should accompany the tender. In both cases a certified copy of the partnership deed and current address of all the partners of the firm should accompany the tender.
- 3.4 If the bidder is a limited company or a corporation, the tender shall be signed by a duly authorized person holding power of attorney for signing the tender accompanied by a copy of the power of attorney. The bidder should also furnish a copy of the Memorandum of Articles of Association duly attested by a Public Notary.

#### **4.0. Final decision making authority.**

The employer reserves the right to accept or reject any bid and to annul the process and reject all bids at any time, without assigning any reason or incurring any liability to the bidders.

#### **5.0. Site visit**

The bidder is advised to visit the site of work, at his own cost, and examine it and its surroundings to himself collect all information that he/she considers necessary for proper assessment of the prospective assignment.

#### **6.0 Eligibility criteria**

The bidder should have satisfactorily completed similar nature of three similar works of value each not less than 40% of estimated value or two similar works each value not less than 60% of estimated value or one similar work value not less than 80% of estimated value during the last three years ending previous day of last date of submission of tenders. Similar works shall mean that SITC of minimum 15 KVA and 30KVA UPS with its associated works. For this purpose, 'cost of work' shall mean gross value of the completed similar nature of work including the cost of materials supplied by the Government / Client, but excluding those supplied free of cost. This should be certified by an officer not below the rank of Executive Engineer / Project Manager or equivalent.

- 6.1 The bidder Should have had average annual financial turnover on UPS Supply should be at least 100% of the estimated cost during the last available three consecutive financial years (FY ending 31/03/2023) certified by Chartered Accountant
- 6.2 The bidder should not have incurred any loss (Profit after tax should be positive) for more than two years during the last available five years (FY ending 31/03/2023).
- 6.3 The bidding capacity of the contractor should be equal to or more than the estimated cost of the work put to tender. The bidding capacity shall be worked out by the following formula:

$$\text{Bidding Capacity} = [A \times N \times 2] - B$$

**Where,**

**A** = Maximum turnover in Works Contract executed in any one year during the last **Three years** taking into account the completed as well as works in progress.

**N** = Number of years prescribed for completion of work for which bids has been invited.

**B** = Value of existing commitments and ongoing works to be completed during the period of completion of work for which bids have been invited.

- 6.4 In case of the work done under private sector, the completion certificate shall be supported with the copies of TDS certificate.
- 6.5 The bidder should own the necessary equipment as per list required for the proper and timely execution of the work. Else, he should certify that he would be able to manage the equipment by hiring etc., and submit the list of firms from whom he proposes to hire.
- 6.6 The bidder should have sufficient number of Technical and Administrative employees for the proper execution of the contract. The bidder should submit a list of these employees stating clearly how these would be involved in this work.
- 6.7 The bidder's performance for each work completed in the last Seven Years and in hand should be certified by an officer not below the rank of Executive Engineer or equivalent and should be obtained in sealed cover.

## **7.0 Evaluation criteria**

- 7.1 Short listing of the bidders shall be subject to thorough verification of their credentials and site inspection of works carried out/ in progress by them, through a technical committee of experts to be constituted by the SETS. The Committee will visit selected worksites of ongoing/completed works of the tenderers to evaluate the capability of the tenderers based on the following: -
  - 7.1.1 Financial capability and their turnover during the last 3 years.
  - 7.1.2 Technical capabilities of the company in the light of subject work.
  - 7.1.3 Nature of works executed by the tenderer during last 3 years.
  - 7.1.4 Organizational structure of the company.
  - 7.1.5 Necessary Resource required by company to carry out the subject work.
  - 7.1.6 Time & quality consciousness.
  - 7.1.7 Tendency of the company with regard to making extraneous claims and disputes.
  - 7.1.8 Site planning ability.
  - 7.1.9 Tendency of the company to award the work on back to back / subletting
- 7.2 however, SETS reserves the right to restrict the list of such qualified contractors to any number deemed suitable by it.



- 7.3 Even though any bidder may satisfy the above requirements, he/she would be liable to disqualification if he/she has:
- 7.3.1 made misleading or false representation or deliberately suppressed the information in the forms, statements and enclosures required in the eligibility criteria document,
  - 7.3.2 Record of poor performance such as abandoning work, not properly completing the contract, or financial failures / weaknesses etc.
- 7.4 Any effort on the part of the bidder or his agent to exercise influence or to pressurize the employer would result in rejection of his bid. Canvassing of any kind is prohibited.
- 7.5 The details submitted by the bidders will be evaluated in the following manner:
- 7.5.1 The eligibility criteria prescribed in Para 7.1 to 7.5 above in respect of experience of similar class of works completed, bidding capacity and financial turn over etc. will first be scrutinized and the bidder's eligibility for the work will be determined.
  - 7.5.2 The bidders qualifying the eligibility criteria as set out in Para 7.1 to 7.5 above will be evaluated by the expert committee on the basis of details furnished by them.

## **8.0. Financial information**

Bidder should furnish the following financial information:

Annual financial statement for the last five years in ( Form "A" ) and solvency certificate in( Form "B" )

## **9.0 Experience in works highlighting experience in similar works**

9.1 Bidder should furnish the following:

9.1.a List of all works of similar nature successfully completed during the last seven years in (Form "C").

9.1.b List of the projects under execution or awarded in (Form "D").

9.2 Particulars of completed works and performance of the bidder duly authenticated/certified by an officer not below the rank of Executive Engineer or equivalent should be furnished separately for each work completed or in progress in (Form "E").

9.3 Information in (Form "D") should be complete and no work should be left out.

## **10.0. Organization information**

Bidder is required to submit the information in respect of his organization in Forms "F".

## **11.0. Equipment and Tools**

Bidder should furnish the list of Tools & Plants to be used in carrying out the work. (in Form "H"). Details of any other plant & equipment required for the work not included in Form "H" and available with the applicant may also be indicated.

## **12.0. Opening of Price bid**

After evaluation of the credentials / documents submitted by the bidder along with Part-I tender, a list of short listed agencies will be prepared based on the eligibility criteria. Thereafter the financial bids of only the qualified and technically acceptable bidders shall be opened at the notified time date and place in the presence of the qualified bidders or their representatives . The validity of the Part-II (Price Bid) tender should be **60 Days** from the date of submission of Part-I tender.

### **i.0 Award criteria**

- i.1 The employer reserves the right, without being liable for any damages or obligation to inform the bidder, to:
  - i.1.a Amend the scope and value of contract to the bidder.
  - i.1.b Reject any or all the tenders without assigning any reason.
- i.2 Any effort on the part of the bidder or his agent to exercise influence or to pressurize the employer would result in rejection of his bid. Canvassing of any kind is prohibited.

**SECTION – II B: FORM OF AGREEMENT AND GENERAL RULES AND DIRECTIONS FOR  
GUIDANCE OF CONTRACTOR**

**ITEM RATE TENDER AND CONTRACT FOR WORKS**

**General rules and Directions**

- 1 All works proposed for execution by contract will be notified in a form of invitation to tender posted in public places and signed by the Engineer in charge, SETS.

This form will state the works to be carried out as well as the date for submitting and opening tenders and the time allowed for carrying out the work, also the amount of security deposit to be deposited by the successful tenderer and the percentage, if any, to be deducted from the bills, Performance Security to be deposited before commencement of the work. Copies of the specifications, designs and drawings, any other documents required in connection with the work designed for the purpose of identifications by the Engineer in charge, SETS. It shall also be open for inspection by the Contractor at the office of the Engineer, SETS, during office hours.

- 1 In the event of the tender being submitted by a firm, it must be signed separately by each member thereof, or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power-of-attorney authorizing him to do so, such power of attorney to be produced with the tender and it must disclose the firm is duly registered under the Indian Partnership Act.
- 2 Receipts for payments made on account of a work when executed by a firm must also be signed by the several partners. Except where the contractors are described in their tender as a firm, in which case the receipts must be signed in the name of the firm by one of the partners or by some other persons having due authority to give effectual receipts for the firm.
- 3 Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort including conditional discounts, will be summarily rejected.
- 4 In case the lowest tender amount of two or more tenderer is same, such lowest tenderer will be asked to submit sealed revised offer in the form of letter mentioning their rates and amount, but the revised quoted rates and amount should not be higher than quoted rates and amount at the time at submission of tender. The lowest tender shall be decided on the basis of revised offers. In case any of such contractor refuses to submit revised offer, then it shall be treated as withdrawal of his/her tender before acceptance and suspended for a period of one year in participation of tender. If the revised tendered amount of two contractors received in revised offer is again found to be equal, the lowest tender, among such contractors, shall be decided by draw of lots in the presence of officer inviting tender or his authorized officers & the lowest tenderer those have quoted equal amount of their tenders.

In case all the lowest tenderer those have quoted same amount, refuse to submit revised offers, then tenders are to be recalled and such refused contractors, shall not be allowed

to participate in the re-tendering process of the work on account of non-submission of revised offer. Also, such refused contractors shall be suspended for a period of one year in participation of tender

- 5 The Engineer in charge, SETS or his duly authorized assistant will open tenders in the presence of any intending tenderer who may be present at the time, and will enter the amounts of the several tenders in a comparative statement in a suitable form.
- 6 The officer inviting tenders shall have the right of rejecting all or any of the tenders, and will not be bound to accept the lowest tender or any other tender.
- 7 The receipt of an accountant or clerk for any money paid by the tenderer will not be considered as an acknowledgment of payment to the Engineer-in-charge, SETS and the Contractor shall be responsible for seeing that he/she procures a receipt signed by the Engineer-in-charge, SETS, or by the Accounts Officer.
- 8 The Memorandum of work tendered for, and the Schedule of Materials to be supplied by the General Services Organization and their issue rates shall be filled in and completed in the office of the Engineer in charge, SETS before the tender form is issued. If a form is issued to an intending tenderer without having been so filled in and completed, he/she shall request the office to have this done before he completes and delivers his/her tender.
- 9 The tenderer shall sign a declaration under the officials Secret Act 1923, for maintaining secrecy of the tender documents drawings or other records connected with the work given to them.

## TENDER FOR WORKS

I/We hereby tender for the execution for the Executive Director, Society for Electronic Transaction and Security (SETS) of the work specified in the under written Memorandum within the time specified in such memorandum at the rates specified therein, and in accordance in all respects with specifications, designs and instructions in writing referred to the Condition of Contract and with such materials as are provided for, by and in all respects in accordance with such conditions as far as applicable.

## MEMORANDUM

- 
- a) General Description : Supply, Installation, Testing and commissioning of 1 x 15 KVA UPS & 1 x 30 KVA UPS machine at SETS, Chennai
- b) Estimated cost (Approx) : Rs. 16,50,000/-
- c) Time allowed for completion: 1 (One) Month
- d) Earnest Money Deposit : Rs. 33,000/-
- e) Security Deposit : 10% of Tendered value
- 

(The Security deposit at 10% the gross amount of the bill shall be deducted from final bill of the contractor of the tendered value of the work.

The Security Deposit & Performance Guarantee will be accepted by Bank Guarantee in any Nationalized Bank of India).

SHOULD THE TENDER BE ACCEPTED IN WHOLE OR IN PART, I/WE HEREBY AGREE:

Rule: 1(i) to abide by fulfill all the terms and provisions of the said conditions so far as applicable and or in default thereof to forfeit and pay to the Executive Director, Society for Electronic Transaction and Security (SETS) or his/her successors in office the sum of money mentioned in the said conditions. A sum of Rs.33,000/-

is hereby forwarded as earnest money. If I/We fail to commence the work specified in the above memorandum, I/We agree that the said Director or his successors in office shall without Prejudice to any other right or remedy, be at liberty to forfeit the Earnest money absolutely otherwise the said earnest money shall be retained by him towards Security Deposit mentioned against Clause (e) of the above mentioned Memorandum.

Dated the \_\_\_\_\_ day of \_\_\_\_\_ 2024

Witness \_\_\_\_\_

Address : \_\_\_\_\_

Occupation \_\_\_\_\_

The above tender is hereby accepted by me on behalf of Executive Director, SETS

\*\* \_\_\_\_\_

Dated the \_\_\_\_\_ day of \_\_\_\_\_ 2022.

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\* Signature of contractor before submission of tender.

\*\* Signature of the Officer by whom accepted.

+ Signature of witness to contractor's signature.

## **ADDITIONAL RULE AND DIRECTIONS FOR THE GUIDANCE OF TENDERERS**

1. The Tender shall be valid for a minimum period of TWO calendar months from the date of opening of Tender
2. The Tender Document including the drawings shall be signed by the Tenderer and returned along with his offer for this work
3. If any Tenderer withdraw from this tender within its validity period or makes any modifications in the terms and conditions of the tender which are not acceptable to the Institute then the Institute of Mathematical Sciences shall without prejudice to any other right or remedy be at liberty to forfeit 50% (Fifty percent) of the Earnest Money absolutely.
4. The tenderer shall note that after the award of the work a comprehensive Agreement setting out all the terms and conditions finally agreed upon between the contractor and the Society for Electronic Transaction and Security (SETS) will be drawn up and signed by both the parties to the Agreement.

5. **Rates :**

Rates quoted shall include labour, materials, tools, plant, appliances, packing, transport, shipment, GST, any import duties and other all taxes. Water and Power Supply, metering and consumption charges, Contractor's supervision, overheads and profit, general risks or liabilities and all that are necessary for the satisfactory completion of the job. The rate shall be firm and shall not subject to the exchange variations, labour conditions or any condition.

6. **Payment Terms**

The following payment terms are applicable

- 90% of supply rate of imperishable materials brought to site and completion of preliminary inspection, successfully testing and commissioning and acceptance of equipment's to the satisfaction of end user.
- Balance 10% of the payment will be released after the completion of warranty period or against the submission of Bank Guarantee in any Nationalized Bank.

7. **Tax deduction at source**

Taxes and duties an applicable to be deducted at source will be deducted and necessary certificates will be issued.

## **POWER AND ELECTRICAL SAFETY**

1. The Department will provide 415 V, 3 phase, 4 wire supply at one location as indicated in the drawing.
2. The Contractor will make arrangements for receiving the power supply. He will have a distribution switchboard with one number incomer switch with HRC fuses and sufficient number of outgoing feeders, properly with HRC fuses protection. Sub-distribution boards may be provided and wired from the distribution board by the Contractor. Cabling from the meter and supply point to the distribution board will be done by the Contractor. The distribution board and other locations shall be provided with danger boards with skull mark.
3. Single phase loads will be connected such that the loads and the 3 phases are balanced.
4. All distribution boards and sub-distribution boards will be properly grounded with 2 ground connections and each board will have one independent pipe earth electrodes.
5. All electrical equipment like switches, motors and power outlets shall be properly grounded and shall be well protected from weather (rain and dust)
6. Equipment with electric prime movers will be installed in permanent manner as far as possible with fixed cabling. Insulated wires in metallic conduits can substitute for armoured cables, if required.
7. Portable lights and equipment (limited to unavoidable tools like vibrators, drills and polishing machine) will be connected using metal clad sockets and plugs to avoid mechanical damage.
8. Insertion of wires in sockets will not be permitted
9. All portable appliances shall be properly grounded.
10. All portable electrical tools will be tested and certified by authorized staff, Contractor's Electrical Supervisor may be authorized for the work by the Department at its discretion.
11. Cabling and wiring will be run underground with proper mechanical protection or overhead beyond normal human reach so as to avoid hindrance to movement of men and materials. Cable route indicators shall be provided as directed by Engineer-in-Charge wherever cables are run underground.
12. For temporary connections 3 Core Insulated and sheathed cables will be used for single phase and 4 core insulated and sheathed cables will be used for 3 phase wiring. Armoured cables will be preferred.
13. Unarmoured cables will not be tied to metal supports using metal wires.
14. All wires used shall be healthy and joints shall be minimum. The joints shall be properly insulated and shall be approved by Departmental Engineer. Joints shall be properly supported and positioned above normal human reach. Joints shall not be permitted in wet areas. Loose wiring will not be allowed over floor. Extra length of wires and cables shall be properly coiled and kept in safe position.
15. Electrical works including temporary connections and extensions will be carried out by licensed electricians only. All electrical installations will be energized only after approval by the Department.

16. List of electrical staff to be posed at site will be furnished by the Contractor before the commencement of Contract.
17. Adequate area lights will be provided by the Contractor to ensure safe working.
18. Departmental electrical staff will be available at Site for rectification of faults up to metered point during normal working hours on normal working days. Contractor's qualified staff will maintain the Contractor's electrical installations.
19. The Contractor will allow free access to engineers of the Institute for inspection of electrical connections and distribution systems and abide by their decisions, in the interest of safety of personnel.



## Section - III

### TENDERING AND CONTRACT CONDITIONS

#### **1. INTRODUCTION:**

This scope of work involves Design, Manufacture, Assembly, Testing at manufactures work, Transportation, safe delivery to site, Complete installation and commissioning of the equipment's mentioned under scope of work with all materials and accessories required for entire UPS system and its associated works for the Society for Electronic Transaction and Security (SETS), Taramani, Chennai- 113.

#### **2. LOCATION**

*The Society for Electronic Transaction and Security (SETS)* is located at MGR Knowledge City, CIT Campus, Taramani, Chennai-113 Tamilnadu, India.

#### **3. Delivery**

This UPS system shall be delivered and installed at the Society for Electronic Transaction and Security (SETS) is located at MGR Knowledge City, CIT Campus, Taramani, Chennai-113. The bidder's attention is drawn to the fact that no tender will be considered unless the bidder's can satisfy the purchaser that he can meet the delivery period specified in the tender documents.

#### **4. INFORMATION TO BE INCLUDED IN THE PROPOSAL**

The bidder shall submit his offer in the price schedule along with all supporting information. It is necessary to upload the drawing and technical data to enable the purchaser to make a detailed comparison and evaluation of tenders preferably with-out the need of request for further information from the bidder. They should also upload the details of UPS supplied to various organization at a cost of more than 17 lakhs.

#### **5. BIDS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS**

Bidder shall quote for UPS Machines strictly in accordance with the specifications.

#### **6. PRICE**

The price should be firm and no variation in cost will be allowed. Price quoted should be on FOR destination basis. Installation and commissioning charges also included in the quoted price. It is mandatory to submit the AMC charges related document for 3 years after the equipment warranty period in consultation with concern manufacturer.

Price for supplying UPS machine shall conform the specification as furnished in the tender document. Price quoted by the Bidder shall be inclusive of GST and other all taxes, import duties, other applicable levies, packaging, insurance & transportation charges.

## **7. PACKAGING, TRANSPORTATION, DELIVERY, UNLOADING AND STORING**

Bidder shall note that the packaging for shipment shall be in accordance with the following instructions. UPS machine components shall be packed and protected so as not to suffer deterioration, damage or breakage during shipment and storage in a tropical climate. All lifting points shall be clearly marked. Each package shall be properly labeled to indicate the type and quantity of material it contains, the purchase order number, dimensions, weights and also a packaging list to identify the components of the UPS machine related to the contract. The supplier shall not ship the components of the UPS machine without the prior written approval of the purchaser's inspector. Complete instructions relating to shipping and documentation will be furnished with the Purchase Order.

The Supplier shall prepare all equipment covered by this specification for transport in such a manner as to protect it from damage in transit & immerse by water and shall be responsible for and make good at his own expense any and all damage due to improper packing. The contents shall be identified on the package. The packing shall be marked with lifting & hook – up points for unloading.

The contractor shall make his own arrangements for the transportation and unloading at site and safe storage at site. The Bidder shall also make his own arrangements for the safe unloading of the equipment covered by this contract. The supplier is responsible for safe delivery and satisfactory installation of the equipment at SETS premises.

## **8. GENERAL:**

All safety precautions are to be taken while at work. Experience and qualified personnel only be employed as required. Site Engineer of the contractor shall meet the Engineer – in-Charge on all working days and finalize the work to be executed on each day with the approval of the Engineer - in-Charge. He/She shall be present at the work spot during the working hours. The supplier will finalize the work programme well in advance in consultation with the Engineer-in-Charge. The supplier shall follow strictly the Government Labour Acts, which are in force at present and all necessary arrangements for labour shall be made by the contractor. The Supplier shall follow strictly all the Safety Rules/Procedures/Codes of the Department in practice and also follow the security rules of the Institute regarding issue of Identity Cards/Tokens, etc. as may be farmed time to time by the purchaser.

## **9. QUALITY SURVEILLANCE**

All work covered by this document shall be subjected to quality surveillance by the Purchaser or his authorized representative. All the components of the UPS machine will be inspected at the manufacturer's works by the purchaser's representative prior to shipping. The supplier shall provide all necessary assistance and facilities for the inspection and testing as specified in this tender specification. Components of the UPS Machine found unsatisfactory as to workmanship or material shall be removed by the tender and replaced with components, which are satisfactory without any additional cost.

## **10. OPERATING MANUAL**

Copies of installation, operation and maintenance manuals shall be supplied prior to the shipping of the components of the UPS Machine. The manual shall be complete with General Arrangement and assembly drawing, etc.. and information required for installation, list of pre-commissioning and preventive maintenance checks to be carried out, operation and maintenance of UPS Machine. The manual shall be include, amongst others, the following particulars also.

## **11. GUARANTEE**

The UPS and its battery banks shall be guaranteed against defective workmanship and material for a period of 24 months from the date of commissioning. The Supplier shall rectify the defects including replacement of components wherever necessary and/ or that may develop during this guarantee period free of cost. The security deposit will be released only after 24 months warranty period of UPS and its batteries from the date of completion certificate or against the BG submitted by any nationalized bank.

## **12. INSURANCE**

The tenderer shall insure at his own cost of all the equipment and materials during transit from his factory to site and the insurance validity period should be till the end of commissioning and submission date of all the equipment's.

## **13. PAYMENT TERMS**

Please note that no advance payment is permissible. The following payment terms are applicable.

- 90% of supply rate of imperishable materials brought to site and completion of preliminary inspection, successfully testing and commissioning and acceptance of equipment's to the satisfaction of end user.
- Balance 10% of the payment will be released after the completion of warranty period or against the submission of Bank Guarantee in any Nationalized Bank.

## **14. INCOME TAX**

Income tax will be recovered from each bills as per latest government norms.

## Section - IV

### INSTRUCTIONS TO TENDERERS

Note: Following instructions should strictly followed while submitting your offer.

1. A copy of latest and current income tax clearance certificate should be forwarded.
2. Taxes and duties etc. applicable should be clearly mentioned by indicating the percentage instead of stating as applicable at the time of dispatch / inclusive of taxes etc. Prices quoted by the Bidder shall be inclusive of GST, all taxes, Import duties if any, duties, other applicable levies, packaging, insurance & transportation charges.
3. Price quoted by you should remain firm throughout the period of the contract.
4. Your offer should valid for a period of 60 days from the date of opening.
5. Descriptive catalog/ leaflets of item offered details of UPS supplied to various organization should be forwarded with the quotation without which the quotation will not be considered at all.
6. Please note that your tender will not be considered unless it is received in sealed envelope super scribed with tender number and due date.
7. Late submitted tenders will not be considered.
8. No tender containing erasures or alterations will be considered.
9. You shall in a separate sheet to the tender, furnish in case you are partnership firm of joint Hindu family concern, the names and full particulars of the members of the joint Hindu family owning the concern. The tender must be signed by the authorized persons only. (Proprietor/ Power of attorney/By all partners etc. as applicable).
10. The tenderers are requested to quote their comprehensive AMC rate of their equipment's and its batteries for the next 7 years after completion of 2 years warranty period in a separate sheet in consultation with concern manufacturer.

## **SECTION - V**

### **PART -A**

#### **SPECIFIC REQUIREMENTS AND SCOPE OF WORK**

##### **1.0 Scope of Tender**

This scope of work is Supply, Installation, Testing and Commissioning at site of Pure sine wave output, True On line, double conversion, 1 x 15 KVA UPS and 1 x 30 KVA UPS System with parallel Three phase input and three phase output 400 V / 50 Hz with separate metal sheet enclosed isolation transformer and STS automatic power changeover switches to SETS, Chennai -113 as detailed in the Schedule of quantities and subsequent sections of this technical specifications.

##### **1.0 Project Data**

Purchaser	:	Society for Electronic Transaction and Security (SETS),
Project site location	:	MGR Knowledge City, C.I.T. Campus, Taramani, Chennai
Climatic conditions	:	The climate is hot and humid with heavy rainfall, conducive to fungus growth
Ambient Air Temperature	:	Varying from 23°C to 45°C depending upon season.

##### **2.0 Time Schedule**

Total time allowed for the work will be as stipulated in the tender notice. The Contractor shall plan various activities to ensure strict adherence to the time schedule and as per the priorities to be decided by the SETS. A chart showing Time schedule for the supply and execution of work shall accompany the offer.

##### **3.0 Storing, Handling and Transport facilities at Site**

The contractor shall be responsible for storing, handling and transporting of all parts of equipment and material (unless otherwise specified) covered in this contract including loading and unloading of material as required and specified in subsequent Sections. Contractor shall make his own arrangement for storage of these materials and equipment before and during execution.

##### **4.0 Testing**

All the equipment's and the items will be inspected / tested at the manufacturer's works in presence of the Engineer Incharge. The Contractor shall give intimation, sufficiently well in advance to plan for the inspection.

The Contractor shall carry out tests on different equipment as specified in the subsequent Section to enable Engineer-in-Charge to determine whether the work complies with the specifications.

Results of site tests and checks shall be furnished in the approved formats. The Contractor shall arrange his own testing equipment required for the tests to be carried out at site as per test schedules / format

enclosed to this specification. The tenderer shall submit along with the offer a list of testing equipment / instrument / tools that they will deploy for testing at site. All the instruments / test equipment used at site shall have a valid test certificate from approved test house.

#### **5.0 Standards and specifications**

All materials and equipment should conform to latest IS specifications. Where IS specifications do not exist, the relevant BS / IEC specifications shall be applicable. Wherever the Contractor envisages supply, only material of approved make shall be purchased.

Equipment and products shall be from ISO 9000 accredited manufacturers, wherever available. All similar equipment and components of different ratings shall be from same source.

Technical particulars of equipment offered shall be submitted along with the offer in the specified format. If more than one brand of equipment is offered, then, all the Technical particulars shall be submitted.

#### **6.0 Scope of work and Equipment Description**

The items of work covered in the Schedule of Quantities are detailed here. The work shall be carried out meeting the requirements in this section and the general specifications and tested in accordance with the test schedule.

The site Engineer shall be consulted for any technical details. Quality work is expected from the Contractor. Catalog Nos. indicated is only for reference purpose. Before effecting the supply approval shall be obtained from Engineer-in-Charge with the latest Catalog. Wherever necessary, detailed drawings shall be prepared and submitted for approval before purchase / execution of work. Contractors are advised to take up fabrication / manufacture after Drawing approval.

## **TECHNICAL SPECIFICATIONS FOR UPS– Part B**

### **TECHNICAL SPECIFICATIONS FOR UPS -Part B**

#### **General requirements in Brief**

The scope of work involves supply and installation of UPS systems shall include design, manufacture, supply, installation, testing and commissioning of all related equipment's together with all accessories and auxiliaries as per specifications.

The system shall be fully operational and shall comply to the specified codes and standards.

The Vendors / contractors shall be responsible for providing all materials, equipment's and engineering services specified or which are required to full fill the intent of ensuring reliability of the total work covered under these specifications within his quoted price.

Supply and installation of the UPS system covered under this specification shall conform to the latest edition of codes and standards mentioned below and all applicable standards.

- a) IEC 60140-3/ENC : UPS Performance.
- b) IEC60140-2/ENC 62040-2 : Electro magnetic compatibility
- c) IEC 60140-1 / ENC 62040-1 : Safety.
- d) 61000-4-5 : Surge testing.
- e) NEMA PE-1-1983 : Uninterrupted Power System Standard.
- f) IP 20 ; Degree of protection.
- g) IEC ; Semi conductor converter standards.
- h) JEC : Standard of the Japanese technical committee
- I) JIS : Japanese Industrial Standards
- j) JEM : The standard of the japan electrical manufactures association.
- k) ISO 9001: 2000 : Approved.

IEC EN 62040-1-2

Uninterrupted Power Systems (UPS)

"General and safety requirements for UPS used in restricted access locations"

EN 50091-2

Uninterrupted Power Systems (UPS)

"Electromagnetic compatibility (EMC) requirements" Class RS

IEC EN 62040-3

Uninterrupted Power Systems (UPS)

"Performance requirements and test methods"

EN ISO 9000

Quality management and quality assurance standards.

Guidelines for selection and use.

EN ISO 9001

## Quality systems

Model for quality assurance in Design, Development, Production, Installation and Servicing.

All the Standard Code document to be made available at site by the vendor / contractor.

## System Maintenance Requirement

The UPS system shall be serviceable suitable for periodical maintenance works as planned. Any scheduled maintenance activity should be carried out without disrupting load at any point of time through the STS switches.

## Testing & Commissioning

The UPS shall be witness tested at the manufacturer's premises by the engineers of The Institute of mathematical science before dispatch for all the technical parameters including the full load test as specified. After physical installation, the UPS shall be tested and commissioned at site by the manufacturer's engineers to establish all the input and output parameters such as Voltage, Frequency, Input Current Harmonic Distortion, Output Voltage Harmonic Distortion, Input Power Factor, Efficiency, Noise Level, Over Load Capacity as specified here in.

Input current harmonic distortion, Output voltage harmonic distortion, Input Power factor, Efficiency, Noise level, Overload capacity are load dependent parameters. It shall not be possible to arrange a full load of 30 KVA at site and hence these parameters can be verified at manufacturer's works only.

Vendor / contractors to Submit Two sets of Testing & Inspection Reports to Institute of mathematical science before dispatch.

## **SYSTEM DESCRIPTION**

### **Design Requirements - UPS Module**

#### **Voltage**

Input / Output specifications of the UPS shall be Rectifier Input 380/400/415 Volts - Three Phase, Bypass Input 415 Volts - Three Phase

Output - 415 V, 3 Ph, 50 Hz

#### **Output Load Capacity**

Specified output load capacity of the UPS shall be 30 KVA for System at > 0.8 lagging Power factor as per data sheets.

#### **Modes of Operation**

The UPS shall be designed to operate as an ON LINE Double conversion type reverse transfer system in the following modes:

Normal: The critical AC load is continuously supplied by the UPS Inverter. The rectifier/ charger derives power from AC Input source and supplies DC power to the Inverter while simultaneously load charging power reserve battery.



Emergency: - Upon failure of AC Input power, the critical AC load is supplied by the Inverter, which without any switching obtains power from the battery. There shall be no interruption in power to the critical load upon failure or restoration of the AC input source.

Recharge:- Upon restoration of AC input power during the emergency mode of operation, the rectifier/ charger shall automatically restart, walk-in and gradually assume the inverter and battery recharge loads.

## **Battery Requirements**

System shall be configured with a 30 min. battery backup with adequate rating battery. The 30 min. backup shall be configured for full load conditions.

Battery should be sealed maintenance free type. The UPS module should have the Battery Circuit breaker mounted near to the batteries. When this breaker is opened no battery voltage should be present in the UPS enclosure. The UPS module should be automatically disconnected when the battery reaches to the minimum discharge voltage level or when signaled by other control functions. Remote tripping of Battery Circuit breaker facility shall be also incorporated.

The battery required can be different as it depends upon the DC voltage bank. The manufacturer is required to submit the calculation of Battery AH for backup time of 30 minutes. The manufacturer should also submit the battery make and model numbers along with optimal operating conditions and design life of battery ensured with list of preferable make. The number of charge-discharge cycles should also be mentioned along with the response.

Battery mounting racks should be custom made based on the overall layout provided and the floor loading capacity of the floor. The rack should have maximum two stack/shelves provisioned to keep batteries. Construction of the battery rack should be using heavy duty epoxy powder coated MS frame of the color as per client requirement. Base of the stand should take care of UDL and should not impose any point load on floor and should be capable of transferring the load to the true floor. The quoted price is inclusive of this battery racks.

## **Product**

### **Materials**

All materials of the UPS shall be new, of current manufacture, high grade and free from all defects and shall not have been in prior service except as required during factor testing.

### **Construction and Mounting**

The UPS unit comprised of Input Isolator, Rectifier/ Charger, Inverter, Static Transfer switch, Maintenance Bypass switch, Isolation transformer and static bypass Input switch shall be housed in a free standing steel enclosure with key lockable doors. Front access only shall be required for expedient servicing, adjustments and installation. The enclosure will be built to comply with IP20 when the doors are open. Required MS stands to be provided along with UPS for mounting at false floor finished level and should be designed to support UDL on floor, there should not be any point load transferred to the true floor. The UPS shall be constructed of replaceable sub-assemblies. Printed circuit assemblies shall be plug-in type.

## **Cooling**

Cooling of the UPS shall be by forced air. Low velocity fan shall be used to minimize audible noise output. Fan power shall be provided by the UPS output. Temperature shall be monitored by thermal sensors.

## **Cable Entry**

Standard cable entry for the UPS module shall be through the enclosure or from bottom. Vendor should make appropriate arrangements to terminate armored input and output cables to the UPS. Supply an laying of all cabling work including termination of input and output is part of scope.

## **Service Area Requirements**

All serviceable sub assemblies shall be modular and capable of being replaced from front of the UPS (Front access only). The UPS module shall require no more than 750mm of front service access room and shall not require rear or side access for service.

## **Components:**

### **Rectifier/Charger**

The term rectifier/ charger shall denote the solid-state equipment and controls necessary to convert incoming AC power to regulate of DC power for input to the inverter and for Battery charging. The rectifier / charger shall be three phase controlled Insulated gate bipolar transistor ( IGBT ) bridge type with constant voltage current limiting control circuitry.

The rectifier should be having facility to check the battery health on a periodic basis upon user request.

The rectifier/charges should provide the functionality of adjusting the battery float voltage as a function of ambient temperature.

### **Input current Walk-in**

The rectifier / charger shall contain time walk-in circuit that causes the unit to gradually assume the load over a 20 sec time interval after input voltage is applied. This time should be configurable at site based on the over all design of the computer center.

### **Fuse Failure protection**

Power semi-conductors in rectifier charger shall be fused with fast acting fuses so that loss of any power semi-conductor shall not cause cascading failures.

### **DC Filter**

The rectifier/ charger shall have an output filter to minimize ripple voltage into the battery. Under no conditions shall ripple voltage into the battery exceed 1 % RMS. The filter shall be adequate to ensure that the DC output at the rectifier charger will meet the Input requirements of the Inverter. The inverter shall be able to operate from the rectifier charger with the Battery disconnected.

## **Battery Recharge**

In addition to supply power for the inverter load, the rectifier/charger shall be capable of producing battery-charging current to recharge the batteries. After the battery is recharged, the rectifier charger shall maintain the battery at full charge until the next emergency operation. Charging shall be an automatic cycle per DIN 41772 characteristics I-U. Both float and recharge voltages shall be adjustable.

## **Inverter**

The term inverter shall denote the solid-state equipment and controls to convert DC power from the rectifier charger or battery regulated AC power for supporting the critical load. The inverter shall be IGBT based sine weighted pulse width modulated (PWM) free frequency design capable of providing the specified AC output, Isolation transformer to be provided at input side.

## **Overload capacity**

Inverter shall be capable of supplying current and voltage for overloads exceeding 100% and up to 150% of full load current for min. of 1 minute. A status indicator and audible alarm shall indicate overload operation. The UPS shall transfer the load to bypass when overload capacity is exceeded. The inverter should have capability to terminate at least 1.7 times neutral conductor as per IEEE specifications.

## **Fault clearing and current Limit.**

Without bypass supply available, the inverter shall be capable of supplying an overload current of 150% of its full load rating in excess of 60 secs. For greater currents, or longer time duration, the inverter shall have electronic current limiting protection to prevent damage to components. The inverter shall be self-protecting against any magnitude of connected output overload.

## **Output Frequency**

The output frequency of the inverter shall be controlled by an oscillator. The oscillator shall hold the inverter output frequency to +/- 0.1 % for steady state and transient conditions. Manufacturer to indicate whether redundancy is provided in the oscillator as a part of the design. Optionally the inverter should be capable of providing steady state frequency using an external redundant oscillator.

## **Output Harmonic**

The output harmonic shall not be greater than 1 % with linear load and shall be < 5% at 100 % non-linear load. The UPS shall be capable of handling load of crest factor more than 3:1.

The output harmonic shall not be greater than 2% with linear load .

## **Inverter Efficiency**

Inverter efficiency shall be greater than 92 % at 100% load.

## **Phase and Frequency Synchronization**

The UPS should have same frequency and phase at any given point of time. All the inverter outputs shall be synchronized for phase and frequency before connecting to load.

## **Display and Controls**

### **Monitoring and Control**

The UPS shall be provided with a microprocessor based unit status display and controls section designed for convenient and reliable user operation. A system power flow diagram, a percentage load and battery time remaining display shall be provided as part of the monitoring and controls sections, which depicts a single-line diagram of the UPS. Illuminated visual indicators shall be of the long-life light emitting diode (LED) type. All of the operator controls and monitors shall be located on the front of the UPS cabinet.

The monitoring functions such as metering, and alarms shall be displayed on an alphanumeric LCD panel. LCD panel shall be provided with following monitoring functions and indicators (each alarm and notice conditions shall be accompanied with an audible alarm)

1. NORMAL: This symbol shall be lit when the UPS is operating in Normal Mode.
2. BATTERY- This symbol shall be lit when the UPS is operating in battery mode.
3. BYPASS - This symbol shall lit when the UPS is operating in bypass mode.
3. WARNING - This symbol shall lit when the system needs attention. Some notices shall be displayed and shall include

UPS on Maintenance Bypass

Inverter UN synchronized

Battery on load

Load on Bypass

Mains Failure

6. ALARM: This symbol shall lit when a situation requires immediate attention. All alarms shall be accompanied by the Audio alarms. Alarm shall include

Emergency Stop

Inverter Off Or Failed

Over- temperature

Overload

Battery C.B. Open

Rectifier Off or Failed

Input C.B. Open

Output C.B. Open

### **SNMP Interface**

The facility to control and monitor of the UPS parameter through the standard SNMP inter face using RJ 45 sockets in the LAN shall be provided . Built in web interface shall be provided.

The UPS monitoring system shall be function through inter net.

### **Power Status Diagram:**

A mimic panel shall be provided to depict a single line diagram of the UPS. Indicating lights shall be integrated within the single line diagram to illustrate the status of the UPS. The six LED shall indicate the following status.

Input Voltage OK  
Bypass Voltage OK  
Load on Bypass  
Load on Inverter  
Battery Voltage OK  
Inverter Output OK

### **Battery Management Systems**

The BMS shall provide battery time available, or percentage remaining with operating in battery mode.

The SNMP enabled battery management system shall provide the immediate shutdown to signal a low battery condition.

Vendor has to quote continuous battery monitoring system suitable for the product as an option in the commercial bid. The technical documentation and features of the battery management system should be included in the technical bid.

### **Remote Monitoring and diagnostics**

A remote monitoring of the UPS systems is desirable in order monitor the various UPS parameters continuously. The system shall provide 24 x 7 x 365 days monitoring of all the installed systems from a remote site. The system shall provide detailed, preventive analysis of connected UPS systems without any of the disturbance associated with an on site visit.

### **The system should provide following features**

Continuous monitoring and performance of the connected UPS systems In-depth analysis of all the functional parameters of the UPS system Providing periodic reports for usage, faults, trend analysis, health etc.

### **Static Transfer Switch**

A static transfer switch and bypass transfer switch shall be provided as part of the tender. The Static switch shall be a Bi-directional naturally commutated high-speed static (SCR type) device rated to carry full load current continuously. The static transfer switch control logic shall contain an automatic transfer logic circuit that senses the status of the inverter logic signals, and operating and alarm signals. This control circuit shall provide an uninterrupted transfer of the load to an alternate bypass source, without exceeding the transient limits, when an overload or malfunction occurs within the UPS, or bypassing the UPS for maintenance.

### **Uninterrupted Transfer**

The transfer control logic shall automatically turn on the static transfer switch, transferring the critical AC load to the bypass source, after the transfer logic senses any of the following conditions. System A and B shall not be connected on bypass.

Inverter Overload capacity exceeded.

Critical AC load over voltage OR under voltage.

UPS fault conditions.

The transfer control logic shall inhibit an automatic transfer of the critical load to the bypass source if any of the following conditions are present.

Inverter Bypass Voltage difference exceeding presets limits.

Bypass frequency out of limits.

Bypass out of synchronization range with inverter output.

### **Uninterrupted Re transfer**

Re transfer of the critical AC load from the bypass source to Inverter output shall be automatically initiated unless inhibited by manual control. The transfer control logic shall inhibit an automatic re transfer of the critical load to the inverter if one of the following conditions exists.

1. Bypass out of synchronization range with Inverter output.
2. Inverter Bypass voltage difference exceeds the preset limits
3. Overload conditions exists in the excess of inverter full load ratings.

### **Maintenance Bypass Isolator**

A manually operated maintenance bypass isolator shall be incorporated into the UPS cabinet to directly connect the critical load to the input AC power source, bypassing the rectifier, inverter and static transfer switch. With the critical load powered from the maintenance bypass circuit, it shall be possible to check out the operation of the rectifier charger, inverter, battery and static switch.

## **EXECUTION**

### **Field Quality Control**

The following inspections and test procedures shall be performed by factory trained field service personnel during UPS start up.

#### **Visual Inspection**

Inspect equipment for sign of damage

Verify installation as per drawing

Inspect cabinet for foreign object

Verify neutral and ground conductors are properly sized and configured. Inspect battery cases.

Inspect battery for proper polarity

Verify all printed boards are configured properly

#### **Mechanical Inspection**

Check all control wiring connections for tightness

Check all power wiring connections for tightness.

Check all terminals, screws, nuts, and / or spade lugs for tightness.

## **Electrical Inspections**

Check all fuses for continuity

Confirm input voltage and phase rotation is correct

Verify control transformer connections are correct for the voltage being used Assure connections and voltage of the battery strings

## **Documentation**

The manufacturer shall supply minimum 2 sets of an installation manual with installation Start-up trouble shooting guide and operation instruction of the specified system.

## **Installation**

The UPS shall be installed by a service engineer fully trained on the UPS by the manufacturer. The manufacturer will have conduct load /site study prior to the commissioning of the UPS. A copy of the load /site study report will have to be submitted with required comments.

## **Service Capability**

The Manufacturer should have the independent service setup with engineers who are fully trained in the UPS. All the service personnel should have the latest power measurement equipments, which will be required during the process of site study, installation and maintenance. All the manufacturers' service engineers should have mobiles or any alternative means of mobile communication, for instantaneous communications as and when the need arises. The manufacturer should have the capability to provide consultancy on the aspect of power quality as and when required for which they should have their own power solutions. (Product and technology). The manufacturer should preferably have a 24x7 call center in order to register calls pertaining to any UPS related problems/issues. The e – mail alert communication shall be provided to designated Institute service personal enabled through SNMP interface as guided by engineer in charge.

The response time to attend the complaint shall be less than one hour in normal working hours. The manufacturer should have its own facility to provide 24 x 7 x 365 days services support in Chennai with a response time of one hours and turn around time of 4 hours. The services through dealers OR strategic partners will not be accepted. The down time should not be more than 24 hrs in any case and other wise they should provide stand by UPS immediately to avoid penalty .

## **Maintenance**

On-line maintenance should be carried out one by one without interruption to the load. During Maintenance one UPS System will be switched OFF. All the loads should automatically without break transfer to the working UPS System. After maintenance of the 1st UPS System, all the loads should be transferred to this UPS and the above activity should be repeated on the other UPS.

Vendors / contractors should give details of the On-line maintenance procedure. The maintenance activity should be carried out at least once in 3 months and a detailed report on each and every component of the UPS shall be submitted to bank.

**Technical Data – Part C**

**1. 30 KVA**

S. No.	Description	Parameters	Compliance (Yes/No)
A	<b>General Specification:</b>		
1	Rating/Output power Capacity	30KVA/30KW	
2	Topology	True Online Double Conversion UPS	
3	Technology	Advance 3-Level Inverter technology with Double conversion topology and pure sinewave output. Digital Signal Processing based.	
4	Make/Model	Reillo /Socomec/ Fuji Electric - Preferred	
5	Rectifier & Inverter	IGBT Base	
B	<b>Input Characteristics:</b>		
6	Phase	Three Phase (3 $\phi$ +N+PE)	
7	Rated input voltage	400/415 V <sub>ac</sub> , (380 V <sub>ac</sub> Optional), (3 $\phi$ +N+PE)	
8	Input voltage tolerance band - without battery sharing with load.	305Vac to 485Vac	
9	Rated input frequency	50/60 Hz (Built-in Static and Manual by-pass switch)	
10	Total harmonic distortion of current ITHD (With mains VTHD < 1%)	<3% at Load 100% <5% at Load 75% <5% at Load 50 % <10% at Load 25 %	
11	Input power factor at rated voltage. (From 25% to 100% load)	>0.99	
12	Input power supply	The UPS should be able to operate with commercial power supply or Standby Generator power supply without interruption.	
C	<b>Battery Characteristics:</b>		
13	Number of lead cells / Battery blocks	32 nos. (Configurable from 32 to 40 Nos)	
14	Rated battery voltage	384 V <sub>dc</sub> (Configurable from 384 to 480 Volt)	
15	Ripple current with recharged battery (%)	<15%	
16	Float voltage (2.25 V/cell., configurable)	540 V <sub>dc</sub>	
17	Recharge Voltage (2.3 V/cell., configurable)	552 V <sub>dc</sub>	
18	Maximum output voltage (Vdc)	552 V <sub>dc</sub>	
19	End of discharge voltage Vdc (1.75 V/cell, configurable)	336 V <sub>dc</sub>	



20	Voltage compensation with reference to the battery room/cabinet temperature (Vper °C)	±0.03 (base on 20 deg C ~30 deg C)	
21	Maximum current to charge battery (A)	20	
22	Battery Charging	Advanced Battery Management System to improve battery performance with 3 stage battery charging modes. which need to adapt the battery charging strategy with Auto Float Boost Charging and an optional temperature compensated battery Charging	
23	Cold Start	Required	
24	Backup time	30 Min	
25	VAH Required	29640VAH	
26	Common Battery Bank Option	Required	
D	<b>Output Characteristics:</b>		
27	Rated power (kVA)	30	
28	Rated active power (kW)	30	
29	Nominal Current (A)	45.5	
30	Rated output voltage	400 V <sub>ac</sub> (configurable from 380 V to 415 V), (3Ø+N)	
31	Rated frequency	50 or 60 Hz (configurable)	
32	Static variation	±1%	
33	Dynamic variation	±5%	
34	Recovery time within ±1%	40mSec-Conform to the Standard EN 62040-3,Class 1	
35	Crest current factor (as per EN 62040-3)	3:1	
36	Voltage distortion at linear load	≤2%	
37	Voltage distortion at non-linear load	≤4%	
38	Frequency stability with inverter synchronized to the by-pass mains	±2% (Factory configurable from ±2% to ±10%)	
39	Frequency stability with inverter not synchronized to the by-pass mains.	±0.1 %	
40	Speed of frequency variation /Slew Rate (settable)	1.5 Hz/sec	
41	Dissymmetry of the phase's voltage with balanced or unbalanced load.	≤1%	

42	Voltage phase shift with balanced and unbalanced load.	120 ± 1deg.	
43	Overload capacity	110% for 60 min., 130% for 10 min., 155% for 1 min.	
44	Battery mode efficiency (%) at full load	95%	
45	Waveform	Pure sinewave	
46	Operating power factor	0.7 Lag to 0.7 Lead Operating PF	
E	<b>Bypass Characteristics:</b>		
47	Rated voltage	400 V <sub>ac</sub> (configurable from 380 V to 415 V), (3Ø+N)	
48	Rated voltage tolerance	305Vac to 485Vac	
49	Rated frequency	50 or 60 Hz (configurable)	
50	Rated frequency tolerance	±2% default (settable from ±2% up to ± 10%)	
51	Switching onto by-pass with Inverter synchronized (UPS in "Normal Mode")	<1 msec.	
52	Switching onto by-pass with non-synchronized Inverter (UPS in "Normal Mode")	<15 msec.	
53	Switching from by-pass to Inverter (UPS in DIM)	<4 msec.	
F	<b>Protection Circuits:</b>		
54	Protections	Input under/over voltage protection; Output under/over voltage protection; Output overload protection; Output short circuit protection; UPS over temperature protection; Battery low/deep discharge protection; Manually operated Maintenance by pass switch	
G	<b>Efficiency Characteristics:</b>		
55	Efficiency AC/AC (System on line)	95.20% @100% Load 95.60% @75% Load 95.40% @50% Load 95.20% @25% Load	
56	Efficiency system in DIM mode (ECO mode)	98.8% @ 100% Load(Battery completely charged) 98.2% @50% Load(Battery completely charged)	
57	Neutral Size	1.5 of I <sub>rated</sub> current	
H	<b>Environmental Characteristics:</b>		
58	Ambient temperature for the UPS	0 to 40° C	
59	Maximum temperature for 8 hours a day	40° C	

60	Average temperature for 24 hours	40° C	
61	Recommended battery temperature	20 to 30° C	
62	Range of relative Humidity	0 to 95% max (without condensing)	
63	Maximum Operating Altitude	Up to 2000m without Derating.	
64	Storage temperature	From -25°C up to 55°C (UPS), 0 to +40°C (for battery)	
65	Acoustic noise at 1 m from panel front (Ref ISO 3746)	<55dB	
66	Intelligent Fan speed control	Required	
I	<b>Mechanical Characteristics:</b>		
67	Dimensions (WxDxH) (mm)	358 x 840 x 1250	
68	Degree of protection for enclosure	IP20	
69	Cooling	Forced by internal fans	
70	Cable entry	Rear side Bottom	
71	Cabinet Color	Front door RAL 9005	
72	Cabinet steel thickness	Frame 1.5mm, front door 1.2mm, covers 1mm	
73	PCB's	Conformal Coating	
74	Full Protection	input, output, bypass, maintenance bypass and battery breaker	
J	<b>Display Characteristics:</b>		
75	Display Type	HMI Display	
76	Parameters	Input: Voltage/Current/kVA/kW/PF/Frequency Output: Voltage/Current/kVA/kW/PF/Frequency Battery: Voltage/Current/Dc Bus Voltage Bypass: Voltage/Current/Frequency Temperature: Rectifier & Inverter IGBT,Bypass Heat Sink	
77	Faults	Input: Under & Over Voltage/Mains Fail/Pre-charge Output: Under & Over Voltage/Overload/Over Temp/Over Current Battery: Under & Over Voltage/Low Trip Battery: Under & Over Voltage	
78	Alerts	Input:- Rectifier ON/OFF Output:-Inverter ON & OFF/ Inverter STS ON/ Load ON Battery:-Charging & Discharging/ Float & Boost Charge/ Battery Low Bypass:STS ON/ Bypass Unavailable	

K	<b>Communication characteristics:</b>		
79	SNMP	RJ 45 Ethernet based	
80	MODBUS	RS 485 Communication Port For BMS	
81	Dry Contacts	Load On Battery/Load On Static Bypass/Battery Low Pre Alarm/Overload, Over temp/Inverter trip	
L	<b>Intelligent Testing of UPS System</b>	Performing a full load test on by unit itself without any additional load banks.	
M	<b>Standards &amp; Certification:</b>		
82	Safety	IEC62040-1 : 2008-06,	
83	EMC/EMI/RFI	IEC62040-2 : 2005-10,	
84	Performance	IEC62040-3 : 2011-03,	
85	Environmental	IEC62040-4 : 2013-04,	
86	Marking	CE	
87	ISO 9001, ISO 14001, ISO 45001, CE & FCC	Required	
88	Type Test Report	OEM should have test certificate for the quoted model/rating or higher, issued by Govt. Labs or NABL accredited test labs	
N	<b>Eligibility Criteria</b>		
89	Annual Average Turnover	Average Sales Turnover of UPS OEM should be at least Rs. 250 Crore during last three financial years. The turnover should be supported by authentic documentary evidence (audited balance sheet and/or Certificate from Chartered Accountant) and confirmation regarding turnover	
90	OEM Should have a 35+ years of experience in the manufacturing of this product. Certificate of Incorporation/ PAN Card with date of incorporation needs to be submitted.	Required	
91	OEM Should have DSIR Approved R&D Centre	Required	
92	OEM Should have IVR based Call Centre to enable for making 24/7 Complaint Call registrations.	Required	
93	OEM Should have eFSR ( Electronic Field Service Report to encourage go green) facility to get the reports immediately after	Required	

	complaint call closures.		
94	OEM must have sales & service support setup and local office in Chennai	Required	
95	UPS OEM should have own service centres manned with proficient service engineers on OEM's direct payroll with engineers presence in Chennai	Required	
96	OEM must be an indian origin company	Required	
97	The quoted model must be exist in the OEM product portfolio for greater than 5 Years	Required	
98	OEM Should have executed projects in Govt Departments	PO Copies and Work Completion Certificate Required	
99	UPS OEM should have past experience for supplying & installing same model On-Line UPS Systems in Chennai on a Govt Departments	PO Copies and Work Completion Certificate Required	
100	Service Support	OEM should have its own Repair/Service-Support center. In case of product failure OEM should replace malfunction product with equivalent working product immediately till the repaired or alternate product received.	
101	UPS OEM Should have own registered office in Tamilnadu for last 10 years	Required	
102	UPS OEM should have ongoing maintenance contracts of same model On-Line UPS Systems as proof of technical capability for providing prompt and effective service support	Required	
103	Make in India Company	Required	
104	Galvanic Isolation	Output of UPS to be isolated galvanically from mains with transformer (isolation Transformer)	

## 2. 15 KVA

S.No	Description	Parameters	Compliance (Yes/No)
A	<b>General Specification:</b>		
1	Rating/Output power Capacity	15KVA/15KW	
2	Topology	True Online Double Conversion UPS	
3	Technology	Advance 3-Level Inverter technology with Double conversion topology and pure sinewave output. Digital Signal Processing based.	
4	Make/Model	Reillo /Socomec/ Fuji Electric - Preferred	
5	Rectifier & Inverter	IGBT Base	
B	<b>Input Characteristics:</b>		
6	Phase	Three Phase (3 $\phi$ +N+PE)	
7	Rated input voltage	400/415 V <sub>ac</sub> , (380 V <sub>ac</sub> Optional),	
8	Input voltage tolerance band - without battery sharing with load.	305Vac to 485Vac	
9	Rated input frequency	50/60 Hz	
10	Total harmonic distortion of current I <sub>THD</sub> (With mains V <sub>THD</sub> < 1%)	<3% at Load 100% <5% at Load 75% <5% at Load 50 % <10% at Load 25 %	
11	Input power factor at rated voltage. (From 25% to 100% load)	>0.99	
12	Input power supply	The UPS should be able to operate with commercial power supply or Standby Generator power supply without interruption.	
C	<b>Battery Characteristics:</b>		
13	Number of lead cells / Battery blocks	32 nos. (Configurable from 32 to 40 Nos)	
14	Rated battery voltage	384 V <sub>dc</sub> (Configurable from 384 to 480 Volt)	
15	Ripple current with recharged battery (%)	<15%	
16	Float voltage (2.25 V/cell., configurable)	540 V <sub>dc</sub>	
17	Recharge Voltage (2.3 V/cell., configurable)	552 V <sub>dc</sub>	
18	Maximum output voltage (Vdc)	552 V <sub>dc</sub>	
19	End of discharge voltage Vdc (1.75 V/cell, configurable)	336 V <sub>dc</sub>	

20	Voltage compensation with reference to the battery room/cabinet temperature (Vper °C)	±0.03 (base on 20 deg C ~30 deg C)	
21	Maximum current to charge battery (A)	10	
22	Battery Charging	Advanced Battery Management System to improve battery performance with 3 stage battery charging modes. which need to adapt the battery charging strategy with Auto Float Boost Charging and an optional temperature compensated battery Charging	
23	Cold Start	Required	
24	Backup time	30 Min	
25	VAH Required	16128VAH	
26	Common Battery Bank Option	Required	
D	<b>Output Characteristics:</b>		
27	Rated power (kVA)	15	
28	Rated active power (kW)	15	
29	Nominal Current (A)	22.5	
30	Rated output voltage	400 V <sub>ac</sub> (configurable from 380 V to 415 V), (3Ø+N)	
31	Rated frequency	50 or 60 Hz (configurable)	
32	Static variation	±1%	
33	Dynamic variation	±5%	
34	Recovery time within ±1%	40mSec-Conform to the Standard EN 62040-3,Class 1	
35	Crest current factor (as per EN 62040-3)	3:1	
36	Voltage distortion at linear load	≤2%	
37	Voltage distortion at non-linear load	≤4%	
38	Frequency stability with inverter synchronized to the by-pass mains	±2% (Factory configurable from ±2% to ±10%)	
39	Frequency stability with inverter not synchronized to the by-pass mains.	±0.1 %	
40	Speed of frequency variation /Slew Rate (settable)	1 Hz/sec	
41	Dissymmetry of the phase's voltage with balanced or unbalanced load.	≤1%	
42	Voltage phase shift with balanced and unbalanced load.	120 ± 1deg.	
43	Overload capacity	110% for 60 min., 130% for 10 min., 155% for 1 min.	

44	Battery mode efficiency (%) at full load	95%	
45	Waveform	Pure sinewave	
46	Operating power factor	0.7 Lag to 0.7 Lead Operating PF	
E	<b>Bypass Characteristics:</b>		
47	Rated voltage	400 V <sub>ac</sub> (configurable from 380 V to 415 V), (3Ø+N)	
48	Rated voltage tolerance	305Vac to 485Vac	
49	Rated frequency	50 or 60 Hz (configurable)	
50	Rated frequency tolerance	±2% default (settable from ±2% up to ± 10%)	
51	Switching onto by-pass with Inverter synchronized (UPS in "Normal Mode")	<1 msec.	
52	Switching onto by-pass with non-synchronized Inverter (UPS in "Normal Mode")	<15 msec.	
53	Switching from by-pass to Inverter (UPS in DIM)	<4 msec.	
F	<b>Protection Circuits:</b>		
54	Protections	Input under/over voltage protection; Output under/over voltage protection; Output overload protection; Output short circuit protection; UPS over temperature protection; Battery low/deep discharge protection; Manually operated Maintenance by pass switch	
G	<b>Efficiency Characteristics:</b>		
55	Efficiency AC/AC (System on line)	94.85% @100% Load 95.45% @75% Load 95.00% @50% Load 93.75% @25% Load	
56	Efficiency system in DIM mode (ECO mode)	98.8% @ 100% Load(Battery completely charged) 98.2% @50% Load(Battery completely charged)	
57	Neutral Size	1.5 of I <sub>rated</sub> current	
H	<b>Environmental Characteristics:</b>		
58	Ambient temperature for the UPS	0 to 40° C	
59	Maximum temperature for 8 hours a day	40° C	
60	Average temperature for 24 hours	40° C	
61	Recommended battery temperature	20 to 30° C	
62	Range of relative Humidity	0 to 95% max (without condensing)	
63	Maximum Operating Altitude	Up to 2000m without Derating.	
64	Storage temperature	From -25°C up to 55°C (UPS), 0 to +40°C (for battery)	



65	Acoustic noise at 1 m from panel front (Ref ISO 3746)	<55dB	
66	Intelligent Fan speed control	Required	
I	<b>Mechanical Characteristics:</b>		
67	Dimensions (WxDxH) (mm)	308 x 803 x 882	
68	Degree of protection for enclosure	IP20	
69	Cooling	Forced by internal fans	
70	Cable entry	Rear side Bottom	
71	Cabinet Color	Front door RAL 9005	
72	Cabinet steel thickness	Frame 1.5mm, front door 1.2mm, covers 1mm	
73	PCB's	Conformal Coating	
74	Full Protection	input, output, bypass, maintenance bypass and battery breaker	
J	<b>Display Characteristics:</b>		
75	Display Type	HMI Display	
76	Parameters	Input: Voltage/Current/kVA/kW/PF/Frequency Output: Voltage/Current/kVA/kW/PF/Frequency Battery: Voltage/Current/Dc Bus Voltage Bypass: Voltage/Current/Frequency Temperature: Rectifier & Inverter IGBT,Bypass Heat Sink	
77	Faults	Input: Under & Over Voltage/Mains Fail/Pre-charge Output: Under & Over Voltage/Overload/Over Temp/Over Current Battery: Under & Over Voltage/Low Trip Battery: Under & Over Voltage	
78	Alerts	Input:- Rectifier ON/OFF Output:-Inverter ON & OFF/ Inverter STS ON/ Load ON Battery:-Charging & Discharging/ Float & Boost Charge/ Battery Low Bypass:STS ON/ Bypass Unavailable	
K	<b>Communication characteristics:</b>		
79	SNMP	RJ 45 Ethernet based	
80	MODBUS	RS 485 Communication Port For BMS	
81	Dry Contacts	Load On Battery/Load On Static Bypass/Battery Low Pre Alarm/Overload, Over temp/Inverter trip	
L	<b>Intelligent Testing of UPS System</b>	Performing a full load test on by unit itself without any additional load banks.	
M	<b>Standards &amp; Certification:</b>		
82	Safety	IEC62040-1 : 2008-06,	
83	EMC/EMI/RFI	IEC62040-2 : 2005-10,	
84	Performance	IEC62040-3 : 2011-03,	
85	Environmental	IEC62040-4 : 2013-04,	

86	Marking	CE	
87	ISO 9001, ISO 14001, ISO 45001, CE & FCC	Required	
88	Type Test Report	OEM should have test certificate for the quoted model/rating or higher, issued by Govt. Labs or NABL accredited test labs	
N	<b>Eligibility Criteria</b>		
89	Annual Average Turnover	Average Sales Turnover of UPS OEM should be at least Rs. 250 Crore during last three financial years. The turnover should be supported by authentic documentary evidence (audited balance sheet and/or Certificate from Chartered Accountant) and confirmation regarding turnover	
90	OEM Should have a 35+ years of experience in the manufacturing of this product. Certificate of Incorporation/ PAN Card with date of incorporation needs to be submitted.	Required	
91	OEM Should have DSIR Approved R&D Centre	Required	
92	OEM Should have IVR based Call Centre to enable for making 24/7 Complaint Call registrations.	Required	
93	OEM Should have eFSR ( Electronic Field Service Report to encourage go green) facility to get the reports immediately after complaint call closures.	Required	
94	OEM must have sales & service support setup and local office in Chennai	Required	
95	UPS OEM should have own service centres manned with proficient service engineers on OEM's direct payroll with engineers presence in Chennai	Required	
96	OEM must be an indian origin company	Required	
97	The quoted model must be exist in the OEM product portfolio for greater than 5 Years	Required	
98	OEM Should have executed projects in Govt Departments	PO Copies and Work Completion Certificate Required	

99	UPS OEM should have past experience for supplying & installing same model On-Line UPS Systems in Chennai on a Govt Departments	PO Copies and Work Completion Certificate Required	
100	Service Support	OEM should have its own Repair/Service-Support center. In case of product failure OEM should replace malfunction product with equivalent working product immediately till the repaired or alternate product received.	
101	UPS OEM Should have own registered office in Tamilnadu for last 10 years	Required	
102	UPS OEM should have ongoing maintenance contracts of same model On-Line UPS Systems as proof of technical capability for providing prompt and effective service support	Required	
103	Make in India Company	Required	
104	Galvanic Isolation	Output of UPS to be isolated galvanically from mains with transformer (isolation Transformer)	

### **Warranty and AMC**

1. Suppliers / Contractor should provide 2 years manufacturer warranty period for UPS machines and its battery bank.
2. Suppliers / Contractors are requested to quote their AMC rate for the UPS machine and its batteries for the next 7 years after completion of 2 years warranty period in a separate sheet after consultation with concern manufacturer

	MECHANICAL DIMENSIONS ( UPS wise )	
1	Weight of UPS	
2	Dimensions of UPS(L x B x H ) in mm	
3	Weight of batteries for 30 minutes Backup	
4	Dimension of batteries(L x B x H )in mm	
5	Ventilation and vermin proof	
6	Colour ( two tone ) Light Gray	
7	Protection lever : with front doors open	

	ENVIRONMENTAL	Required
1	Operating temperature	0-40 deg C
2	Max. temp for 8 hrs day	40 deg C
3	Relative humidity	Up to 95 % (non condensing)
4	Noise level	< 64 db 1 mt
5	cooling	Forced air
6	Radio Interference Level	EN 50091

**Test Schedule for Commissioning at site and formats – Part D**

<b>Sr. No.</b>	<b>Description</b>	<b>Yes</b>	<b>No</b>	<b>Remarks</b>
1	Inspect equipment for sign of any damages			
2	Verify installation as per drawing			
3	Inspect cabinet for foreign object			
4	Verify neutral and ground conductors are properly sized and configured. Inspect battery cases.			
5	Inspect battery for proper polarity			
6	Verify all printed boards are configured properly			
7	Check all control wiring connections for tightness			
8	Check all power wiring connections for tightness.			
9	Check all terminals, screws, nuts, and / or spade lugs for tightness			
10	Check all fuses for continuity			
11	Confirm input voltage and phase rotation is correct			
12	Verify control transformer connections are correct for the voltage being used Assure connections and voltage of the battery strings			
13	Input power factor test at 100% load > 0.99			
14	Input current harmonic distortion level test at 100% load < 3%			

## **SECTION- VI**

### **a) LIST OF DRAWINGS**

The SETS building drawings are available in the Office of the Engineer – in –charge (for the bidders interested to view only). It is advised to visit the location and site of work to get the correct information and details of the nature of work before tendering.

## SECTION - VII

### a. Schedule of Preferred Make :

#### **LIST OF APPROVED MAKE UPS SYSTEM WITH 2 YEARS WARRANTY**

##### **1. Fuji Electric since we have similar make UPS and we are going to use as a parallel**

Frequency stability with inverter not synchronized to the by-pass mains.	±0.1 %
Speed of frequency variation /Slew Rate (settable)	1 Hz/sec
Dissymmetry of the phase's voltage with balanced or unbalanced load.	≤1%
Voltage phase shift with balanced and unbalanced load.	120 ± 1deg.
Overload capacity	110% for 60 min., 130% for 10 min., 155% for 1 min.
Battery mode efficiency (%) at full load	95%
Waveform	Pure sinewave
Operating power factor	0.7 Lag to 0.7 Lead Operating PF
<b>Bypass Characteristics:</b>	
Rated voltage	400 V <sub>ac</sub> (configurable from 380 V to 415 V), (3Ø+N)
Rated voltage tolerance	305Vac to 485Vac
Rated frequency	50 or 60 Hz (configurable)
Rated frequency tolerance	±2% default (settable from ±2% up to ± 10%)
Switching onto by-pass with Inverter synchronized (UPS in "Normal Mode")	<1 msec.
Switching onto by-pass with non-synchronized Inverter (UPS in "Normal Mode")	<15 msec.
Switching from by-pass to Inverter (UPS in DIM)	<4 msec.
<b>Protection Circuits:</b>	
Protections	Input under/over voltage protection; Output under/over voltage protection; Output overload protection; Output short circuit protection; UPS over temperature protection; Battery low/deep discharge protection; Manually operated Maintenance by pass switch

<b>Efficiency Characteristics:</b>	
Efficiency AC/AC (System on line)	94.85% @100% Load
	95.45% @75% Load
	95.00% @50% Load
	93.75% @25% Load
Efficiency system in DIM mode (ECO mode)	98.8% @ 100% Load(Battery completely charged)
	98.2% @50% Load(Battery completely charged)
Neutral Size	1.5 of I <sub>rated</sub> current
<b>Environmental Characteristics:</b>	
Ambient temperature for the UPS	0 to 40° C
Maximum temperature for 8 hours a day	40° C
Average temperature for 24 hours	40° C
Recommended battery temperature	20 to 30° C

Range of relative Humidity	0 to 95% max (without condensing)
Maximum Operating Altitude	Up to 2000m without Derating.
Storage temperature	From -25°C up to 55°C (UPS), 0 to +40°C (for battery)
Acoustic noise at 1 m from panel front (Ref ISO 3746)	<55dB
Intelligent Fan speed control	Required
<b>Mechanical Characteristics:</b>	
Dimensions (WxDxH) (mm)	308 x 803 x 882
Degree of protection for enclosure	IP20
Cooling	Forced by internal fans
Cable entry	Rear side Bottom
Cabinet Color	Front door RAL 9005
Cabinet steel thickness	Frame 1.5mm, front door 1.2mm, covers 1mm
PCB's	Conformal Coating
Full Protection	input, output, bypass, maintenance bypass and battery breaker
<b>Display Characteristics:</b>	
Display Type	HMI Display
Parameters	Input: Voltage/Current/kVA/kW/PF/Frequency Output: Voltage/Current/kVA/kW/PF/Frequency Battery: Voltage/Current/Dc Bus Voltage Bypass: Voltage/Current/Frequency Temperature: Rectifier & Inverter IGBT,Bypass Heat Sink
Faults	Input: Under & Over Voltage/Mains Fail/Pre-charge Output: Under & Over Voltage/Overload/Over Temp/Over Current Battery: Under & Over Voltage/Low Trip Battery: Under & Over Voltage
Alerts	Input:- Rectifier ON/OFF Output:-Inverter ON & OFF/ Inverter STS ON/ Load ON Battery:-Charging & Discharging/ Float & Boost Charge/ Battery Low Bypass:STS ON/ Bypass Unavailable
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MODBUS	RS 485 Communication Port For BMS
Dry Contacts	Load On Battery/Load On Static Bypass/Battery Low Pre Alarm/Overload, Over temp/Inverter trip
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EMC/EMI/RFI	IEC62040-2 : 2005-10,
Performance	IEC62040-3 : 2011-03,
Environmental	IEC62040-4 : 2013-04,
Marking	CE



**TENDER NOTICE NO.: SETS/Chn/Elec/UPS/2023-24/TR/**

**Name of Work: Design, Supply, Installation, Testing and commissioning of 30 KVA and 15 KVA UPS machine and it's associated electrical works at SETS, MGR Knowledge City, C.I.T Campus, Taramani, Chennai – 600 113.**

**Schedule of the Quantity and Rates**

<b>S. No.</b>	<b>Description</b>	<b>Qty</b>	<b>Unit Price</b>	<b>Amount Rs. P</b>
1	i. 30 KVA UPS, ii. Battery iii. SNMP Card iv. Other Accessories v. Installation & Commissioning			
2	i. KVA UPS ii. Battery iii. SNMP Card iv. Other Accessories v. Installation & Commissioning			
<b>Total</b>				
<b>Add: Applicable tax (Specify rate of GST)</b>				
<b>Rounding off (+/-)</b>				
<b>Grand Total</b>				

**Note:**

1. The schedule must be read along with all specifications and scope of works and general specifications.
2. Rate quoted must include all components required for meeting specification and performance required of the item irrespective of whether they are specifically brought out in the schedule or not.
3. The rate quoted shall be inclusive of GST and other applicable taxes.
4. The firms are requested to quotes their rates after site inspection and analysis based on the list of available makes specified in the inquiry.

Authorised Signature  
(With Seal)